

Harvey S. Gentry

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# Rhodora

JOURNAL OF

## THE NEW ENGLAND BOTANICAL CLUB

Vol. 34.

October, 1932.

No. 406.

### MONOGRAPHIC STUDIES IN THE GENUS ELEOCHARIS—II<sup>1</sup>

H. K. SVENSON

(Plates 219–221)

Series 6. PALUSTRIFORMES

Sub-series: PALUSTRES

Sub-series: TRUNCATAE<sup>2</sup>

- a.* Achenes<sup>3</sup> 0.7–1.5 mm. long (including style-base); upper sheath truncate, indurated and usually mucronate at summit....*b.*
- b.* Achenes with prominent keel-like angles; spikelets long-cylindric.....62. *E. tricostata.*
- b.* Achenes without keel-like angles....*c.*
- c.* Rootstocks very stout, 4–5 mm. in diameter; scales of the rootstock 2–3 cm. long; culms subterete (North-western United States).....68. *E. decumbens.*
- c.* Rootstocks thinner; rootstock-scales when present rarely exceeding 1 cm. in length; culms usually angled or flattened....*d.*
- d.* Culms flattened, frequently exceeding 1 mm. in width; scales of the spikelet (except sometimes in var. *atrata*) with conspicuous whitened, often bifid, acuminate tips.....60. *E. compressa.*
- d.* Culms 4–8-angled; scales obtuse to acute, or in *E. acutisquamata* with acuminate but not whitened tips....*e.*

<sup>1</sup> Brooklyn Botanic Garden Contributions, No. 65. The present paper is a continuation of the series in RHODORA xxxi., there ending on p. 242. The numbering of the species continues that in the earlier paper.

<sup>2</sup> This group (defined in RHODORA xxxi. 128 and Contrib. Gray Herb. No. 86 (1929)) is strictly American. For treatment of the North American representatives of the sub-series Palustres see M. L. Fernald and A. Brackett, RHODORA xxxi. 57–77, and Contrib. Gray Herb. No. 83 (1929).

*E. densa*, without apparent septae, and very close to the tropical *E. geniculata*, is omitted from the present key and will be later treated with *E. geniculata* and *E. nodulosa*.

<sup>3</sup> In study of the achene-markings a magnification of 30x–40x has been used.



- e. Scales acuminate, usually somewhat spreading (Texas).....61. *E. acutisquamata*.
- e. Scales obtuse to acute....f.
- f. Style-base much depressed or truncate, often with a central apiculate projection....g.
- g. Tip of upper sheath whitened; achenes 0.7–1 mm. long; culms capillary, not exceeding 8 cm. in height (Newfoundland to Western Quebec and Northern New England).....59. *E. nitida*.
- g. Tip of upper sheath dark-girdled; achenes 0.9–1.5 mm. long; culms coarser (sometimes capillary in typical *E. capitata*)....h.
- h. Rootstocks creeping and elongated.....58. *E. capitata*.
- h. Rootstocks vertical and greatly thickened; the numerous wiry culm-bases persisting (Northern Pacific States).....67. *E. Bolanderi*.
- f. Style-base conic, pyramidal or mucroniform....i.
- i. Style-base mucroniform, its sides nearly parallel; the nearly smooth achenes showing only faint reticulation under magnification (Mexico to South America).....65. *E. montana*.
- i. Style-base conic or pyramidal....j.
- j. Spikelets linear-lanceolate, 1–1.5 cm. long.....64. *E. Parishii*.
- j. Spikelets ovoid to ellipsoid....k.
- k. Surface of achene scarcely reticulate under magnification; style-base pyramidal (Texas).....66. *E. Palmeri*.
- k. Surface of achene clearly pitted or reticulate under magnification....l.
- l. Surface of the olivaceous achene coarsely and deeply roughened-reticulate, the projecting angles of the cells conspicuous.....58. *E. capitata*.
- l. Surface of the yellowish or brown achene with shallow but distinct pitting or reticulation.....63. *E. arenicola*.
- a. Achenes 1.7–2 mm. long (including style-base); upper sheath oblique, not indurated.....69. *E. fallax*.

The following abbreviations for herbaria are employed in citation of specimens (where no letter is appended, the specimens are in the Gray Herbarium):

B. Brooklyn Botanic Garden; C. Canadian National Herbarium; D. C. C. Deam; G. Gray Herbarium; I. University of Illinois; N. United States National Herbarium; N. Y. New York Botanical Garden; P. Pomona College; Ph. Philadelphia Academy of Natural Sciences; S. Riksmuseet, Stockholm; T. University of Tennessee; W. University of Wisconsin.

With the exception of *E. palustris* no North American species of *Eleocharis* has suffered so much from nomenclatorial tangles as *E. capitata*, and it is safe to say that none offers so complex a series of morphological variations. Until comparatively recent times the name *E. tenuis* (Willd.) Schultes was accepted for the common plant

of eastern United States, but Blake<sup>1</sup> has shown that the name *E. capitata* must be based entirely upon the Clayton specimen cited by Linnaeus from Gronovius' "Flora Virginica," an interpretation which has been followed by nearly all botanists in America. Blake's view has, however, been disputed by Farwell (RHODORA xxxii. 180–181 (1930) and Am. Midland Nat. xii. 175–178 (1930), who would apply the name *E. capitata* to the plant now known as *E. obtusa* (Willd.) Schultes upon the basis of Linnaeus' description of the spikelet as "subglobosa" and the culm as "tereti." Kalm's specimen of *E. obtusa* now in the Linnaean herbarium seems not to have been there in 1753 (Blake, RHODORA xxxii. 182 (1930)), but Farwell believes that a literal interpretation of the description is all-important and that the species under discussion was based upon a specimen of *E. obtusa* then in Linnaeus' herbarium but unrecorded and subsequently lost. Britton<sup>2</sup> has also found it difficult to reconcile Linnaeus' description of the spikelet as "subglobosa" with the elliptic spikelets which are characteristic of *Scirpus tenuis* and concludes that there was probably "some ancient error or mixture." Robert Brown was by no means the first botanist to recognize difficulties in the determination of *Scirpus capitatus* L., for as early as 1789, Ehrhart<sup>3</sup> had recognized that the contemporary interpretation of *S. capitatus*, the plant now called *Eleocharis ovata* (Roth) R. & S., was incorrect. Roth, in his earlier work,<sup>4</sup> held to Schreber's treatment, but in 1793<sup>5</sup> clearly realized that *Scirpus capitatus* did not grow in Germany and characterized the true plant as having tetragonous culms, no bristles, three stamens and three styles, in other words, *S. tenuis*. The plant which had been passing in Europe as *Scirpus capitatus* was thereupon described by Roth as *Scirpus ovatus*. The counterpart of this interpretation is seen in America in the treatment of *Scirpus obtusus* as *S. capitatus* L., by

<sup>1</sup> RHODORA xx. 23 (1918).

<sup>2</sup> TORREYA xix. 246 (1919). See also the discussions by Fernald, RHODORA xxiii. 106 (1921), and by Mackenzie, RHODORA xxx. 237 (1928).

<sup>3</sup> Beitrüge iv. 155 (1789), where *Scirpus capitatus* of Schreber, Krockner and Roth [i. e. *E. ovata*] is said to differ from *S. capitatus* L., the former having a compressed culm, two stamens, and a bifid style. This comparison I take to be with the Gronovian plant (Clayton 380), but there is the very remote possibility that Kalm's plant (*E. obtusa*) might have been the basis of comparison, since *E. obtusa* invariably has three stamens and sometimes a three-parted style.

<sup>4</sup> Tent. Fl. Germ. i. 28 (1788), referring to Schreber's Spic. Fl. Lips. 60 (1771).

<sup>5</sup> Tent. Fl. Germ. ii. 562 (1793). "Planta indicata et sub hoc nomine descripta non est *Scirpus capitatus* Linn., monenti Praes. de tetra-bar, sed longe aliena et nova species. Deleatus itaque nomen specificum cum differentia specifica et eiusdam loco ponatur."



Barton,<sup>1</sup> Elliott, Bigelow and other early writers. Perhaps this general confusion explains Roth's comparatively late (1793) publication of *Scirpus ovatus*, a European plant well known in earlier times.<sup>2</sup>

Linnaeus' description of *Scirpus capitatus* (Sp. Pl. i. 48 (1753)) was very brief:

5. SCIRPUS culmo tereti nudos etiformi, spica subglobosa. Scirpus culmo setaceo nudo, spica subglobosa. *Gron. virg.* 12. *Habitat in Virginia.*

It is most probable that Clayton's specimen came from eastern Virginia,<sup>3</sup> and a photograph loaned to me by Dr. Blake reveals the slender form which is characteristic of the coastal region. Since this form must be considered as typical, the outline of the achene becomes important, but Clayton's plant, which has been kindly examined for me by Mr. J. E. Dandy of the British Museum, is unfortunately immature and without achenes. There is little doubt however that the achenes, if they had been developed, would be small, olivaceous, and with a pyramidal style-base. Dr. Robinson's no. 470, collected in Clayton's neighborhood, agrees well in habit with the Linnaean specimen, and I have figured it (FIGS. 56, 57) as representing typical *E. capitata*. The typical form is recognizable as the very slender plant of moist, often sandy places, common northward to New England on the coastal plain and to some extent in the Piedmont region, and also found together with many other plants typical of the coastal plain in the silicious region of southern Nova Scotia.<sup>4</sup>

The name *Scirpus filiformis* Lamarck (1791)<sup>5</sup> antedates *Scirpus tenuis* Willd. (1809). A photograph of the type of *Scirpus filiformis* has been kindly supplied to me by Professor H. Lecomte of the Muséum d'Histoire Naturelle, in Paris. In this photograph four detached culms with spikelets occupy the center of the sheet together

<sup>1</sup> Compend. Fl. Phil. 31 (1818). "*S. ovatus* Willd. . . . *S. capitatus* Schreb. and Swartz. . . . From a careful comparison of original specimens from Schreber, Willdenow, and Swartz, in my herbarium with our native plant, I have added the above synonyms."

<sup>2</sup> A number of pre-Linnaean references are given by Willdenow, Sp. Pl. i. 294 (1797).

<sup>3</sup> John Clayton (1686-1773) was clerk of Gloucester County, Virginia. For biographical sketch see Britten, Journ. Bot. 47. 297-301 (1909).

<sup>4</sup> Mrs. Erlanson, Mich. Acad. Sci. Papers iv. 130 (1925), considers the very depauperate form represented by Grimes' no. 3774 from the vicinity of Williamsburg, Virginia, as probably the type form, but the Clayton type as shown in Dr. Blake's photograph is considerably larger than the Grimes' specimen in the Gray Herbarium.

<sup>5</sup> Ill. i. 138 (1791). The complete Latin citation is as follows:

651. SCIRPUS filiformis. S. culmo filiformi subangulato nudo, spica terminali ovata, squamis obtusis. Ex America septentrionali.

with the label "*Scirpus filiformis* du New York. Neumas [? the name is illegible] 88." Three culms to one side of the sheet have a small illegible label apparently reading "du la Caroline freyer [?]." One of the latter is identical with the material from New York, which is unmistakably typical *Eleocharis capitata*; the other culms from Carolina, though appearing immature, probably represent *E. tricostrata* and so conform to a later description by Vahl,<sup>1</sup> and also to the derived descriptions by Pursh and Poirét of *S. filiformis* "spica oblonga obtusa." "Hab. in Carolina inferiore Lamarck." Although there is some mixture of species, the predominating material, in addition to carrying the label, conforms to Lamarck's description "culmo filiformi subangulato" and "spica terminali ovata." On the basis of material represented in this photograph *Scirpus filiformis* Lam. should without hesitation be considered a synonym of *S. capitatus* L.

The exact identity of *Scirpus tenuis* Willd. is not clear, but a minute fragment of a spikelet of the type specimen in the Berlin Herbarium, which I have examined through the kindness of Dr. Mattfeld and Mr. Weatherby,<sup>2</sup> seems to be the typical form of *Scirpus capitatus*. The type is in a juvenile state, having been grown at Berlin from seed sent to Willdenow by Muhlenberg. *Scirpus ellipticus* Willd. no. 1172, derived from Muhlenberg, and included under *E. tenuis* by Boeckeler, is, according to Dr. Mattfeld's letter, in a still younger condition. The culm of *Eleocharis tenuis* has generally been considered as four-angled, and the cross-section is so illustrated in Gray's Manual, ed. 7, fig. 258, but some material, and this is especially so in capillary specimens from Pennsylvania and Virginia, shows five-angled culms when carefully sectioned. *Scirpus quadrangulatus* Muhlenberg (1813), generally considered as a synonym of *Scirpus tenuis*, would seem by its very name to have been outstanding in culm characteristics, and it is very likely the plant with prominently four-angled culms, not uncommon in Pennsylvania, which I treat as *E. capitata* var. *pseudoptera* Weatherby.

As in other species of *Eleocharis*, variation in achenes is striking, but in *E. capitata* there is also a remarkable diversity in the culms as

<sup>1</sup> Vahl, Enum. ii. 248 (1805); Pursh, Fl. N. Am. i. 54 (1814); Poirét, Encyc. Meth. Suppl. v. 93 (1817); also *Isolepis filiformis* R. & S. Syst. ii. 106 (1817) and *Eleocharis filiformis* Kunth, Enum. ii. 146 (1837).

<sup>2</sup> I wish here to express my appreciation of Mr. Weatherby's kind assistance throughout my work at the Gray Herbarium in translations and bibliographic references, and especially for a series of detailed notes on the morphology and geographical variation of *Eleocharis capitata*.



seen in cross-section. Not only has the study of individual achenes of each specimen been necessary, but also in a very large number of cases sections of the culm have been examined. For routine work culms were boiled and then cross-sectioned with fine scissors. For the more careful cutting and staining of cross-sections of specimens, some of which are shown in the accompanying plate (220), I am greatly indebted to Miss H. M. Rusk of the Brooklyn Botanic Garden, and for the photographing of these sections, in addition to the achenes shown on the same plate, I must thank Mr. Louis Buhle, also of the Brooklyn Botanic Garden. To all who have made loans of specimens for study I am very grateful.

Four distinct geographical trends, which I have treated as varieties, appear in this examination of achenes and culm-sections. The var. *typica* characteristic of the coastal plain, has capillary culms, small olivaceous achenes with deep pitting and pyramidal style-base; var. *verrucosa* of the Mississippi Valley is similar, but with a depressed style-base; var. *borealis* is the coarse plant in bogs northward; and var. *pseudoptera* is confined to a limited area in the Middle Atlantic States. The achenes range from 0.9 mm. to 1.2 mm. in length including the style-base, but their mass varies much more than these small limits would indicate, due to varietal differences in turgidity of achene and in relative length of style-base. The achenes of var. *borealis* are as a rule larger in bulk than those of the other varieties. On the Atlantic seaboard there is little difficulty in the delimitation of these geographical variants and the number of intergrading specimens is surprisingly few. On the other hand examination of a large number of specimens from the Great Lakes region and the Mississippi Valley has not fully solved the problem of the interrelationship of *E. capitata*, *E. compressa*, and *E. acutisquamata*. A critical determination of specimens of *Eleocharis* is often difficult or even impossible if the material has been collected in the flowering stage, or if, as so often happens, the achenes have failed to develop, due to the attack of fungi or to other causes. The following key will serve to distinguish these geographical varieties of *E. capitata*:

- a. Achenes wax-yellow,<sup>1</sup> in age becoming golden-yellow to dull orange,<sup>2</sup> averaging 1-1.1 mm. long (including the style-base); reticulation of achene usually shallow, the wavy transverse bands formed by the projecting cells thus more

<sup>1</sup> According to Ridgeway's "Color Standards and Color Nomenclature." Washington, D. C. (1912).

<sup>2</sup> *Xanthine-orange* in Ridgeway.



regular than in the typical variety; style-base flattened-triangular, often poorly distinguished from the body of the achene, with a short central projection; culms relatively stout, usually 6-8-angled. Bogs, meadows and pond-shores, Newfoundland to British Columbia and southward to the mountains of Tennessee.....

Var. *borealis*.

a. Achenes olivaceous<sup>1</sup> (before maturity sometimes yellowish in var. *pseudoptera*, or yellowish-white in var. *typica*); reticulation of achene usually deep.....

b. Culms about 0.5 mm. thick, greatly elongated (usually 30-90 cm. tall), with 4 wing-like angles; achenes 1-1.1 mm. long, including the flattened triangular style-base. New Jersey to Virginia.....

Var. *pseudoptera*.

b. Culms capillary, rarely exceeding 30 cm. in height; achenes averaging 0.9-1 mm. long, including the style-base.....

c. Achenes with an acute pyramidal style-base often 1/5 as high as the body of the achenes; culm 4-angled or 5-angled. Atlantic Coastal Plain.....

Var. *typica*.

c. Achenes with a flattened style-base; reticulation as in var. *typica* but usually with some of the cell-projections verrucose; culms 5-angled. Mississippi Valley.....

Var. *verrucosa*.

58. *E. CAPITATA* (L.) R. Br. var. **typica** (FIGS. 56, 57 and PLATE 220, FIGS. 1, 13). Culms capillary, 0.5-4 dm. high, usually quadrangular with slightly concave sides or five-angled, erect from a thickened creeping ligneous rootstock; stolons thickened, elongate, covered with acute brown or reddish scales; sheaths truncate at the apex, with a short mucro: spikelets ellipsoid to ovoid, acute or blunt, 3-10 mm. long, 20-30-flowered; scales ovate, obtuse or acute, reddish-brown to black, with a scarious margin and green keel; the lowest scale sub-orbicular and larger: styles 3-fid; stamens 3: achene obovoid, 0.8-1 mm. long, trigonous, olivaceous, alveolate, sometimes with wavy transverse bands formed by the projecting angles of the vertically elongated cells: style-base brownish, pyramidal: bristles 2 or 3, rarely persisting, light brown, less than half as long as the achene.—Prod. i. 225 (1810) as to the name-bringing synonym; S. F. Blake, RHODORA xx. 23-24 (1918). *Scirpus capitatus* L., Sp. Pl. i. 48 (1753). *Scirpus tenuis* Willd., Enum. i. 76 (1809). (?) *Scirpus quadrangulatus* Muhl., Cat. 6 (1813) *nomen nudum*, not *S. quadrangulatus* Michx., Fl. i. 30 (1803). *Scirpus filiformis* Lam., Ill. i. 138 (1791); Pursh, Fl. N. Am. i. 54 (1814). *Eleocharis tenuis* Schultes, Mant. ii. 89 (1824); Torr., Ann. N. Y. Lyc. iii. 309 (1836) and Fl. N. Y. ii. 349 (1843); Kunth, Enum. ii. 145 (1837) probably excl. Brazilian plants;<sup>2</sup> Boeckl., Linnaea xxxvi. 448 (1869-1870); Britton, Journ. N. Y. Mic. Soc. v. 108 (1889); Britton & Brown, Ill. Fl. i. 255, fig. 595 (1896);<sup>3</sup> C. B. Clarke, Ill. Cyp. t. 39, figs. 6-9 (1909).<sup>4</sup> *Scirpus ellipticus* Willd.<sup>5</sup> ex Kunth, Enum. ii.

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<sup>1</sup> Yellowish-olive in Ridgeway.

<sup>2</sup> Plants which I have seen so labeled are not *E. capitata*.

<sup>3</sup> This illustration represents the typical achene with conical style-base.

<sup>4</sup> These figures, accompanied in the legend by the notation "forma filiformis" undoubtedly represent the typical variety.

<sup>5</sup> In a letter sent to Mr. Weatherby, Dr. Mattfeld writes that the material represented by Willdenow 1172 is very young, and consists of a mixture of three spikelets of *Scirpus tenuis* and one of *S. obtusus*, as identified by Dr. Gray.

146 (1837); ?*Eleocharis filiformis* Kunth and *E. elliptica* Kunth, Enum. ii. 146 (1837). *Eleogiton filiformis* A. Dietr., Sp. Pl. 96 (1840). *Trichophyllum tenue* Farwell, Rep. Mich. Acad. Sci. xxi. 359 (1920).—Nova Scotia to Virginia, chiefly on the coastal plain, but ascending some of the river valleys of eastern New England. NOVA SCOTIA: North Sydney, Cape Breton Island, *Macoun* 32228 (C); Halifax, *Macoun* 32224 (C); dryish gravelly banks, Meteghan, *Fernald & Long* 20154; peaty open pasture, Yarmouth, *Bissell, Pease, Long & Linder* 20152, 20153; flood plain of Salmon River, Truro, *Bean & White* 20159; New Germany, *Hamilton* 80823; Shubenacadie Grand Lake, *Fernald & Bissell* 20160. NEW HAMPSHIRE: shallow margin of river, Woodstock, *Fernald* 15508. MASSACHUSETTS: Amesbury, *A. A. Eaton*; Mystic Pond, *Wm. Boott* in 1873; Gay Head, *Seymour* 1605; West Tisbury, *Seymour* 1867, 1868. NEW YORK: moist depressions in oak woods, Bay Terrace, Staten Island, *Svenson* 3496 (culms 4–6 angled); swamp north of Manorville, Long Island, *Ferguson* 1502 (B); Montauk, *Ferguson* in 1923; swamp, Hempstead Reservoir, Long Island, *Ferguson* 392 (B). NEW JERSEY: Kaigns Point, *MacElwee* 293; Forked River, *MacElwee* in 1896. PENNSYLVANIA: Naomi River, Pocono Mt., *Porter* in 1893 (Ph); McCalls Ferry, *MacElwee* 724; roadside ditch, Greene County, *Dickey* 252 (pathological); Cresson, *Wm. Boott* in 1875; Whiteland, Chester County, *E. B. Bartram* 1025. DELAWARE: 1 mile west of Stanton, *Randolph* 106 (distributed as *E. Torreyana*); sandy shores of estuarine inlet, Claymont, *Svenson* 3156. MARYLAND: sandy soil, open scrub land 2 mi. west of Elkton, *Randolph* 132. DISTRICT OF COLUMBIA: wet places in woods, Marshall Hall, *Holm* in 1899 (W). WEST VIRGINIA: by creek, Pickens, Randolph County, *H. H. Smith* 1354 (W). VIRGINIA: Williamsburg, *Grimes* 3760; Millboro, *C. F. Wheeler* in 1907; in dry soil of old fields near Buckroe, *Robinson* 470; Fairfax, *E. C. Leonard* 321 (B).

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 Var. **borealis**, n. var. (FIGS. 58, 59 and TAB. 220, FIGS. 4, 15), culmis crassioribus 6–8-angulatis; achaeneis luteis, angula exteriori obtusa; stylo-basi depressa, obtusa vel truncata, in medio apiculata.—Newfoundland to British Columbia; southward to New Jersey, Tennessee, Indiana, and Illinois. Specimens examined: NEWFOUNDLAND:<sup>1</sup> borders of pools and rills in limestone barrens, St. John Bay, *Fernald et al* 27523; Bay Bulls, Avalon Peninsula, *Fernald, Long & Dunbar* 26327; Bay of Islands, *A. C. Waghorne*; gravelly river bank, Glenwood, *Fernald & Wiegand* 4706; St. Johns, *Robinson & Schrenk* 127; springy places in ledges and gravel, Grand Falls, *Fernald & Wiegand* 4707; peaty or muddy borders of ponds, Grand Falls, *Fernald & Wiegand* 4710. QUEBEC: Romaine, Saguenay County, *St. John* 90183 (G, C); arbor vitae swamps, Carleton, Bonaventure County, *Fernald, Collins & Pease* in 1904; north fork of Madeleine River, Gaspé County, *Fernald*,

<sup>1</sup> Only a few specimens from the large collection in the Gray Herbarium from Newfoundland are cited.



*Dodge & Smith* 25497; vicinity of Montmorency Falls, *Macoun* 9300; Anticosti, *Marie-Victorin* 20162 (G, W), 2715 (W); Grindstone Island, Magdalen Islands, *Fernald et al* 6962. NEW BRUNSWICK: Bathurst, *Blake* 5443; St. John River, Connors, *Pease* 2969; Restigouche River, *Macoun* 32225 (C). NOVA SCOTIA: North Mt., Belle Isle, *Fernald et al* 23379; cool swamp near Digby, *Howe & Lang* 205; Rockville, Yarmouth County, *Fernald & Long* 20158; brackish marsh, Sand Beach, Yarmouth, *Long & Linder* 20147 (TYPE in Gray Herb.); border of brackish marsh at head of Abram River, *Fernald, Bean & White* 20161. MAINE: bog, summit of Mt. Battie, Camden, *G. G. Kennedy* 21; Sangerville, *Fernald* 303 (G, W); Monhegan Island, *Churchill* in 1921 (W); Orr's Island, *A. H. Norton* in 1924 (W) with somewhat flattened culms and large blackish spikelets. NEW HAMPSHIRE: bog near Crawford House, *Greenman* 1136; Warren, *E. F. Williams* in 1908; Holderness, *F. C. Seymour* in 1915 (W). VERMONT: sandy shores of bay north of South Hero, *E. Brainerd* in 1899; Ripton, *E. F. Williams* in 1908; South Cliff, Willoughby Mt., *Faxon* in 1895. MASSACHUSETTS: Great Pond, South Weymouth, *Greenman* 749; white cedar swamp, Springfield, *Clark & Seymour* G581 (W); Chelsea, *W. Boott* in 1853; Polpis, Nantucket, *M. A. Day* 30; Granville, *Seymour* 171. RHODE ISLAND: Morris Swamp, Providence, *J. F. Collins* in 1892. CONNECTICUT: Oxford, *Harger*, *Kneucker* Cyp. Exsicc. 138. NEW YORK: South Hill, Ithaca, *C. C. Thomas* 1766; Lake Harris, 1650 ft. alt., Essex County, *House* 7351; Mud Pond, Oswego, *Fernald, Wiegand & Eames* 14183; in sphagnum, pine barren bog, Central Islip, *Ferguson* 3052 (B); near bottom of glacial kettle-hole, Montauk, *N. Taylor* in 1914 (B). NEW JERSEY: Ridgefield, *Dautun* 21; Torrey ex herb. *Thurber* (without locality). PENNSYLVANIA: Dillerville Swamp, Lancaster County, *Heller* in 1901 (as *E. glaucescens*). TENNESSEE: Fountain City dam, east of water, *J. K. Underwood*, April 23, 1930 (B). ONTARIO: Marshfield, *C. F. Wheeler* in 1893; Frenchman's Bay, Lake Huron, *Macoun* 34570; Pelee Island, Lake Erie, *Macoun* 32227 (C). MICHIGAN: Port Huron, *C. K. Dodge* in 1893; Bois Blanc Island, Jackson County, *Camp* 3224 (W); sandy shore of Temperance Point, L. Michigan, *Ehlers* 2652 (W). INDIANA: East Chicago, *Lansing* 2578; Roby, *Lansing* 2541; Clarke, *Umbach* 3887 (W), 3647 (W), 4205 (W); along railroad, east of Bushrod, Greene County, *Deam* 10650 (D); marl border of Fish Lake, Lagrange County, *Deam* 39074 (D) (perhaps *E. compressa*); low marl border of lake east of Lagrange, *Deam* 36640 (D); low marl border of Still Lake, Howe, *Deam* 31298; in a slough 1 mi. south of Griffith, Lake County, *Deam* 31635 (D); Deep Lake, Noble County, *Deam* 14686 (D); ditch along railroad, Idaville, White County, *Deam* 38865 (D). WISCONSIN: Green Bay, *J. H. Schuette*; Bailey's Harbor, Door County, *J. J. Davis* in 1929 (W); Cornucopia, *J. J. Davis* in 1880 (W); Clark's Lake, *J. J. Davis* in 1929. MANITOBA: Red Deer Lake, lat. 53, *Macoun* 74. MINNESOTA: Fort Snelling Reservation, *C. O. Rosendahl* 2098. MON-

TANA: Columbia Falls, *R. S. Williams* in 1895. BRITISH COLUMBIA: swamp near Goldstream, *Macoun* 1067 (G, Ph); Eagle Pass, *Macoun* 7558.

Var. **pseudoptera** Weatherby,<sup>1</sup> n. var. (TAB. 220, FIGS. 3, 16), vaginis superioribus longe mucronatis, mucroni ad 1.5 mm. longo; culmis arcte quadrangulatis saepe leviter transverse septatis, angulis peracutis tenuibus siccatis sicut alae prominentibus, fasciculis vasorum plerumque 4, singulis ad angulas singulas, vel rarius 2 ad culmi latera inter angulas, costas tenues formantibus, distributis; acheniis olivaceis vel luteis obovoideis pyriformibusve infra in basim sicut stipitem subabrupte angustatis, minute reticulato-rugosis, stylo-basi fusco vel griseo plerumque depresso mucrone angusto acuto cuspidata rarius convexo vel subpyramidale terminato.—Except when otherwise noted, all of the following specimens are at the Philadelphia Academy of Natural Sciences. NEW JERSEY: in fresh water, Bergen Point, Hudson County, June 18, 1893, *Thomas Seal*, TYPE in herb. Philadelphia Acad.; ditches and wet places, New Egypt, *Gross* 745; Skunk Swamp in a ditch, West Cape May, *O. H. Brown*, June 20, 1907; Closter, *Austin* in 1864 (B); New Durham, *Dautun* in 1903 (B); Hasbrouck Heights, *Dautun* in 1908 (B). PENNSYLVANIA: herb. *C. W. Short* (W); Bucks County, *Pretz*, June 17, 1899; wet springhead, Bethlehem, *Pretz* 5734; Ogontz, *B. Long* in 1908; Philadelphia, *Nuttall*; Springfield, *B. H. Smith*, June 20, 1891; serpentine region southeast of Wissiston, *Van Pelt* in 1905; cedar barrens, *Pennell*, June 27, 1912; forming a swale in serpentine barrens along Conewago Creek, *Svenson* 3454 (B). DELAWARE: without definite locality, *Baldwin* ex herb. Schweinitz; low ground along Penn. R. R., Claymont, *Svenson* 3457 (B); springy place in field, 1 mi. west of Stanton, *L. F. & F. R. Randolph* 107 (G). VIRGINIA: 4-mile run, *A. S. Hitchcock* in 1905 (I).

In this variety, which ranges from New Jersey and eastern Pennsylvania to Virginia, the culms, though becoming the stoutest in the entire species, remain 4-angled and with 4 vascular bundles, or if one or two others occur sometimes between the angles, they are much smaller, forming only a slender rib. The angles are very acute and project at the corners of the culm like narrow wings. The achenes of this variety are in most cases olive, subpyriform and with a truncate tubercle. The sheaths commonly have an unusually long and prominent mucro (up to 1.5 mm. long). This variety is easily recognized in the field; the elongated glistening culms form dense swales, sometimes nearly a meter high.

Var. **verrucosa**, n. var. (TAB. 220, FIGS. 2, 14), acheniis olivaceis verrucosis, stylobasi depressa; culmis quinquangulatis.—INDIANA:

<sup>1</sup> The description is by Mr. Weatherby.





H. K. Svenson del.

ELEOCHARIS, SERIES PALUSTRIFORMES.

(Habit  $\times \frac{1}{2}$ ; achenes  $\times 15$ ).

FIGS. 52, 53, *E. DECUMBENS*; 54, 55, *E. NITIDA*; 56, 57, *E. CAPITATA*, var. *TYPICA*;  
58, 59, *E. CAPITATA*, var. *BOREALIS*; 60, 61, *E. ACUTISQUAMATA*; 62, 63, *E. COMPRESSA*.







*H. K. Svenson del.*

ELEOCHARIS, SERIES PALUSTRIFORMES.

(Habit  $\times \frac{1}{2}$ ; achenes  $\times 15$ ).

FIGS. 64, 65, *E. ARENICOLA*; 66, 67, *E. PARISHII*; 68, 69, *E. BOLANDERI*; 70, 71, 72, *E. MONTANA*; 73, 74, *E. PALMERI*; 75, 76, *E. TRICOSTATA*; 77, 78, *E. FALLAX*.





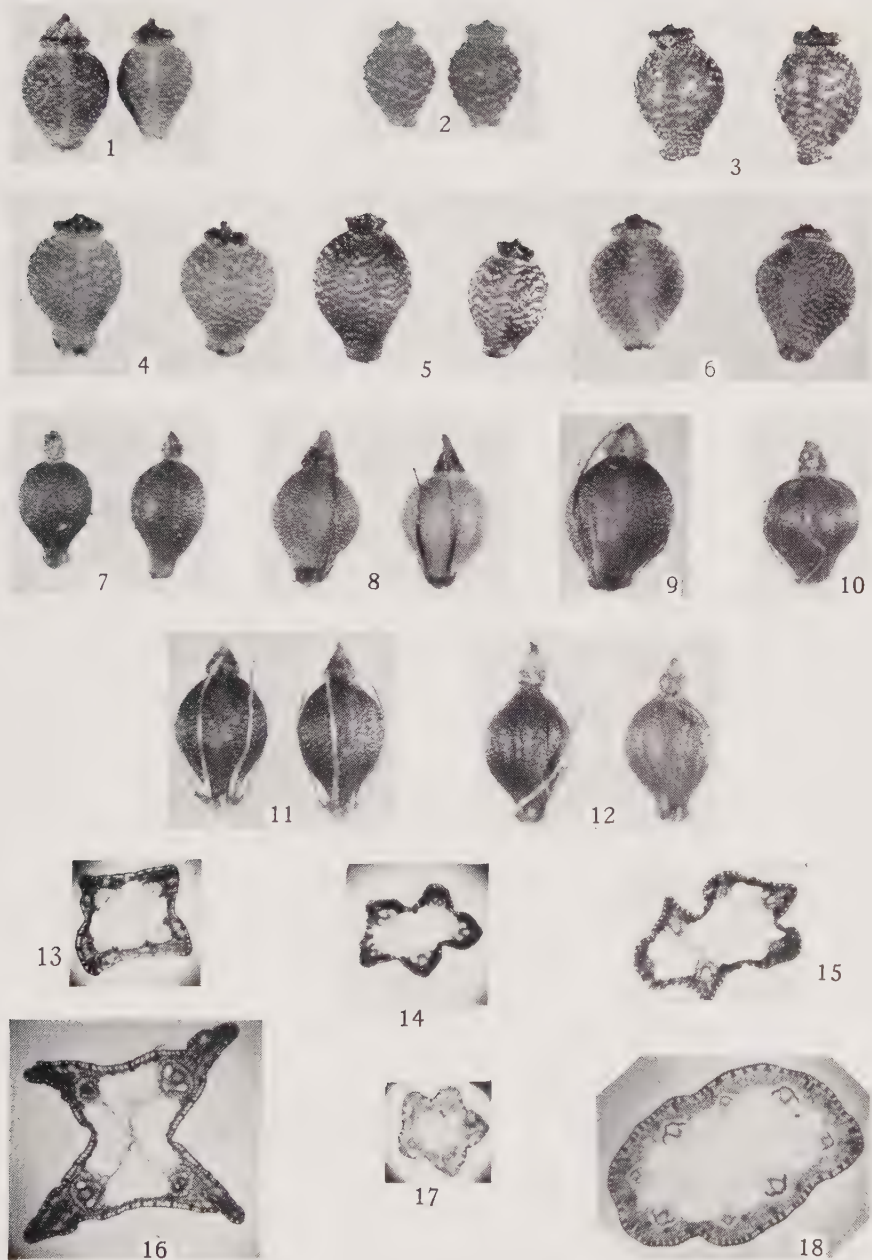


Photo. Louis Buhle.

ELEOCHARIS, SERIES PALUSTRIFORMES.

(Achenes  $\times 20$ ; cross-sections of culms  $\times 40$ ).

FIGS. 1, 13, 17, *E. CAPITATA*, var. *TYPICA*; 2, 14, *E. CAPITATA*, var. *VERRUCOSA*; 3, 16, *E. CAPITATA*, var. *PSEUDOPTERA*; 4, 15, *E. CAPITATA*, var. *BOREALIS*; 5, 18, *E. COMPRESSA*; 6, *E. COMPRESSA*, var. *ATRATA*; 7, *E. ACUTISQUAMATA*; 8, *E. ARENICOLA*; 10, *E. MONTANA*; 11, *E. PALMERI*; 12, *E. PARISHII*.



border of a swamp 1 mi. east of Palmyra, *Deam* 23414; along ditch 6 mi. south of Terre Haute, *Deam* 48781 (B); 2 mi. southeast of Degonia Springs, Warrick County, *Deam* 25278; roadside 4 mi. southeast of Loogootee, *Deam* 12848; roadside 8 mi. southeast of Cannelton, *Deam* 25054; in hard white clay soil in an abandoned field along Little Pigeon Creek, Spencer County, *Deam* 46803; border of a pond 9 mi. south of Marengo, *Deam* 23476; in low woods 4 mi. southeast of Palmyra, *Deam* 23427; in an interdunal marsh  $2\frac{1}{2}$  miles southeast of Tefft, *Deam* 45927; low wet woods  $3\frac{1}{2}$  miles southeast of Hanover, *Deam* 38889; in hard white clay soil 5 mi. southeast of Mt. Vernon, *Deam* 46779;<sup>1</sup> low woods 10 mi. southwest of Mt. Vernon, *Deam* 25382. ILLINOIS: moist open soil, Glen Ridge, Macon County, *I. W. Clokey* 2373 (I); moist ditch, Wady Petra *V. H. Chase* 643 (D, G, I); Peoria, *M. F. Brendel* (I); thin upland soil in open woods, Taylorville, *W. E. Andrews* in 1899 (I); Mississippi river bottoms, Oquawka, *H. N. Patterson* (I); prairie, Denver, *F. C. Gates* 8824 (I); *Vasey* 18611 (without locality) (I). MISSOURI: wet woods, St. Louis [?], *Eggert* May 21, 1878 (B). ARKANSAS: Cedar Gap, low wet ground, alt. 1675 ft., *O. E. Lansing* 3040 (TYPE in Gray Herb.). OKLAHOMA: damp fields, Pryor Creek (Indian Territory), *R. Bebb* 274<sup>a</sup> (W).

59. *E. NITIDA* Fernald (FIGS. 54,55). Perennial from a slender rootstock: culms capillary, 4-angled, striate, 2-8 cm. high; apex of upper sheath slightly inflated, whitish: spikelet oblong-ovoid, somewhat acute, 2.5-4.5 mm. long, 1.5-2.5 mm. thick, 8-20 flowered; scales elliptic-oblong, with rounded tips, purplish-brown, with greenish ribs and very narrow scarious margins, the lowermost larger: achene golden-yellow when mature, narrowly obovoid, sharply trigonous, 0.7-1 mm. long, the roughened surface and depressed tubercle as in *E. capitata* var. *borealis*.—RHODORA viii. 129 (1906); Robinson & Fernald in Gray, Man. ed. 7, 184. fig. 260 (1908).—Moist places, chiefly in acid peat, Newfoundland and Quebec, south to Nova Scotia and New Hampshire. NEWFOUNDLAND: springy pasture at foot of Lookout Mountain, Bonne Bay, *Fernald & Wiegand* 2708; wet peaty barrens at about 365 m., Lookout Mountain, Bonne Bay, *Fernald, Long & Fogg* 1347; damp gravel at margin of Junction Brook, *Fernald & Wiegand* 4711; wet soil, Millerton, *Jansson* in 1930. QUEBEC: springy place, at border of swamp, Parker's Station, Pontiac County, *Macoun* in 1903, (TYPE in Gray Herb.). NOVA SCOTIA: exsiccated roadside gutter, North Mt., Belle Isle, *Fernald et al* 23380. NEW HAMPSHIRE: boggy pastures by Dixville road, Colebrook, *Fernald & Pease* 16972.

<sup>1</sup> *Deam's* nos. 46779 and 25382 have some of the achenes with conical style-bases and are perhaps transitional to var. *typica*.

(To be continued)



## DIARRHENA FESTUCOIDES

M. L. FERNALD

DIARRHENA *festucoides* (Raf.) <sup>2ae ed</sup> comb. nov. *Festuca diandra* Michx. Fl. Bor. Am. i. 67, t. 10 (1803), not Moench (1794). *Diarina festucoides* Raf. Med. Repos. hex. 2, v. 352 (1808). *Diarrhena americana* Beauv. Agrost. 142, t. 25, fig. II (1812). *Korycarpus arundinaceus* Zea ex Lagasca, Gen. et Sp. Pl. 4 (1816). *Diarina sylvatica* Raf. Journ. de Phys. lxxxix. 104 (1819). *Korycarpus arundinaceus* Zea ex Spreng. Syst. i. 123 (1825). *Diarrhena diandra* (Michx.) Wood, Class-Bk. ed. 2: 612 (1847); Hitchcock, Trans. Acad. Sci. St. Louis, v. 529 (1891). *Korycarpus diandrus* (Michx.) Kuntze, Rev. Gen. Pl. 772 (1891).

Although the generic name *Diarrhena* Beauv. Agrost. 142 (1812) is conserved under the International Rules over "*Corycarpus* ('*Korycarpus*') Zea in: Acta matrit. (1806)" and "*Diarina* Raf. in Med. Repos. New York V. (1808) 352," there is considerable doubt whether its conservation was necessary. *Diarina* was not validly published as a genus by Rafinesque in 1808. At that time he merely enumerated in a "Prospectus" many things "which I mean to publish, and only want arrangement and leisure," like much which we all project without proper publication, although careful workers refrain from rushing into print with unconsidered matter. Among the prospective "genusses . . . will be . . . *Diarina* (*festucoides*) from the *festuca diandra*, Mich." Without a single word of differentiation *Diarina* (1808) was not a validly published new genus. As a validly published genus *Diarina* started in Raf. Journ. de Phys. lxxxix. 104 (1819), where it was well described and the name of its species changed from that of 1808: "Type *D. sylvatica*, qui est la *Festuca diandra* de Michaux, etc." In the meantime, however, in 1812, Palisot de Beauvois, without any reference to Rafinesque and his *Diarina festucoides* of 1808, coined the new generic name *Diarrhena*, giving its proper derivation, a detailed generic diagnosis and analytical figures, and he called the one species *D. americana*. Since *Diarina* Raf. had no valid publication as a genus until 1819 and Rafinesque made no reference whatever to the *Diarrhena* of Beauvois (1812) the two must be treated as wholly different generic names (not as mere variations of spelling); and it should be clear that the conservation of *Diarrhena* (1812) over *Diarina* (1819) was unnecessary.

When we consider *Korycarpus* it is at once noteworthy that the best bibliographies are unable to state the page of its publication. Thus Index Kewensis has

KORYCARPUS, Zea, in Act. Matr. (1806); ex Lag. Gen. et Sp. Nov. 4 (1816) = **Diarrhena**, Rafin.

Overlooking for the moment the fact, already discussed, that *Diarrhena* was a genus of Beauvois, not of Rafinesque, we come to the more significant point: that neither Dalla Torre & Harms, Briquet (*Règles Internationales*) nor Nash (in Britton & Brown, where *Korycarpus* is taken up) could carry the reference to anything more conclusive. The Royal Society Catalogue gives no paper by Zea as late as 1806, though Lagasca cited in his general bibliography "Zea in Actis Academiae medicae matritensis." This series is not enumerated in such later bibliographies as I have been able to examine. Turning again to Lagasca (1816), whose publication of *Korycarpus* is cited in Index Kewensis and by Dalla Torre & Harms, we get a clue. Lagasca's *Genera et Species Plantarum, quae aut novae sunt, aut nondum recte cognoscuntur* has (p. 4) a diagnosis of "KORYCARPUS, Zea" with *K. arundinaceus* "Ze. Ac. Matr. 1806" clearly described as its one species, grown in the Botanic Garden at Madrid from seed received in 1803. The genus and species were put out by Lagasca among "*Genera et Species . . . quae . . . novae sunt*," not as a genus and a species already published; and in the Preface (Lectori) he explicitly states that much of the new material published by him was derived from a manuscript which in 1806 was passed around among the students at Madrid. Until *Korycarpus* Zea can be carried back of Lagasca in 1816, its actual publication by Zea, himself, in 1806 is at least open to doubt. The last publication by Zea given by Colmeiro<sup>1</sup> was in 1805.

Although *Diarina* was not validly published as a genus by Rafinesque in 1808, the SPECIFIC NAME, *festucoides*, was validly published, a substitute for *Festuca diandra* Michx. (1803) which was invalidated by *F. diandra* Moench (1794). By some (for instance, Sprague, in a letter regarding a parallel case) it might be argued that, since *Diarina* Raf. (1808) was not then validly published as a genus, its species would, therefore, be illegitimate. But, following the abandonment years ago of the salutary and constructive "Kew Rule," the species and the specific epithets have now become all-important. Under the more upsetting and complicating rules now in force it makes little or no difference under what genus or what generic name a species was proposed, so long as it was proposed as a species. The species stands by itself, regardless of the nomenclatural or taxonomic status of the genus under which it was first put forward. Thus, *Lysimachia terrestris* (L.)

<sup>1</sup> Colmeiro, *La Botánica y los Botánicos de la Península Hispano-Lusitana*, 191 (1858).

BSP. (of the *Primulaceae*) rests, as to specific name, on Linnaeus's absurd publication of it as a Mistletoe, *Viscum terrestre* L.!

In his classic *Flora Caroliniana* (1788), Thomas Walter was unable to place many NEW SPECIES in proper genera; consequently, when too much puzzled, he repeatedly set up a new genus *Anonymos*. He had 2 genera with the pseudonym *Anonymos* under the *Diandria Monogynia*, 2 under *Triandria Monogynia*, 3 under *Pentandria Monogynia*, 3 under *Pentandria Digynia*, and so on to a total of 28. These various genera were all properly characterized, with diagnoses distinguishing them from related genera and with splendidly detailed descriptions; yet, as *Anonymos*, they had no generic names! The fact that Walter considered them genera is clear: "there are four plants called *Anonymos aquaticus*, two called *A. repens*, and six called *A. caroliniensis*."<sup>1</sup> That these are all species and not to be considered as belonging to one heteromorphic genus was clearly and rightly maintained by Blake: "It seems to the writer . . . that these names should not be rejected on the ground of homonymy, since the genera under which they were published, though unfortunately all provided with the same apology for a name, were properly described and differentiated, and the case is therefore not comparable with that of identical specifics in the same genus."

In this case the species belonged to validly defined but nameless genera; in the case of *Diarina festucoides* the validly published species belonged to a named but invalidly published genus. Walter's new specific names under his 28 nameless genera have been transferred to their proper genera and we now have the universally recognized *Crotalaria rotundifolia* (Walt.) Poir., *Gerardia setacea* (Walt.) J. F. Gmel., *Elytraria caroliniensis* (Walt.) Pers., *Lachnanthes tinctoria* (Walt.) Ell., *Ruellia caroliniensis* (Walt.) Steud., *Lithospermum caroliniense* (Walt.) MacM., *Nymphoides aquaticum* (Walt.) Fern., *Micranthemum umbrosum* (Walt.) Blake, etc., etc.

Many other somewhat parallel cases come to mind; but those cited are sufficient to indicate that, with the abandonment of the "Kew Rule" and the treatment of specific epithets quite apart from the generic, the whole theory of specific nomenclature was changed. Under the existing rules *Diarina*, in 1808, was not a validly published GENUS; but, at the same time, *D. festucoides* was an adequately published SPECIES.

#### GRAY HERBARIUM.

<sup>1</sup> Blake, RHODORA, xvii. 130 (1915), in a paper, "Some Neglected Names in Walter's *Flora Caroliniana*."



GERANIUM DIVARICATUM IN THE UNITED STATES.—There are two sheets in the United States National Herbarium named *Geranium divaricatum* Ehrh. One specimen was collected by M. S. Bebb in Ogle County, Illinois, and the other by F. C. Gates (No. 2209) on the campus of the University of Illinois, Urbana, on October 1, 1907. No mention of this species is made in the current floras of the Eastern United States, nor in the North American Flora. It is possible that the plant has not survived its early immigration, or that it may have been referred to some of our native or established species. The plant collected by Bebb (U. S. Nat. Herb. 593651) agrees with the description given by Bonnier (Flore Complète de France, Suisse et Belgique 2: 82. pl. 99, f. 519). Bonnier described the carpels as “ridés en travers (cross-wrinkled) et velus,” agreeing with our specimens. In the related species, *Geranium molle* L., he describes the carpels as “ridés en biais” (slant-wrinkled). The leaf-outline of our specimens differs conspicuously from that of *Geranium molle*. In *Geranium divaricatum* the leaf segments are oval, and somewhat pinnatifid. In *Geranium molle* the segments are cuneate-obovate and 3-toothed, the middle tooth being somewhat longer than the lateral ones. Bonnier gives the range of *G. divaricatum* as Spain, France, and Central Europe to western Asia. Other specimens examined are from Russia, Southeastern Europe, and Switzerland.—IVAR TIDESTROM, Bureau of Plant Industry, Washington, D. C.

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## PHYMOSIA REMOTA IN CAPTIVITY

S. C. WADMOND

THAT was a most interesting bit of news in the July RHODORA telling of the discovery of a new station for this rarest of American phanerogams, and particularly since, as I sat down to read the article, I had only to glance out of the window to see Phymosia in bloom in my own garden, where it thrives like a green bay tree. It occurred to me that a brief account of our efforts to preserve it from extinction might be of interest.

The story begins ten or more years ago when the late Dr. Mills-paugh, realizing that Phymosia would soon become extinct in its then only known station—the little gravelly island in the Kankakee River near Altorf, Illinois—brought a few seeds from its island home

to Mrs. C. L. Hutchinson, that worthy patron of plant and bird life, hoping this exceedingly rare plant might be made to grow on her Lake Geneva, Wisconsin estate, "Wychwood," and thus be saved from utter extinction. She has told me of how eagerly and how anxiously she and her skillful head gardener, Mr. William P. Longland, watched for the germination of the curious hairy kidney-shaped seeds. Five plants rewarded their efforts the first season.

Just as soon as it was well established, distribution began. Seven years ago Mrs. Hutchinson sent the writer a vigorous root which has now developed into several fine colonies. From these two sources plants are now growing in the Arnold Arboretum, Missouri Botanical Garden, at the Universities of Wisconsin and Chicago, and other institutions, as well as in dozens of private gardens at Lake Forest and Winnetka, Illinois, and Geneva and Delavan Lakes, Wisconsin. Herbarium specimens have been sent to many institutions by the writer.

Plants and seeds sent to W. A. Toole of Baraboo, Wisconsin grew nicely and so successful has he been with it that his 1932 catalog lists the seeds for sale under the name *Sphaeralcea remota*! He found, however, that the seeds did not germinate readily, and on the advice of the Seed Laboratory of the United States Department of Agriculture, scarified them between pieces of emery paper. From the scarified seeds he got very good germination but practically none from seeds previously planted which had not been so treated. In his catalog he suggests that for successful germination the seeds be soaked in warm water for 24 hours before planting.

Only yesterday I had the very great pleasure of seeing at least 500 plants in bloom at the Lakeview Nursery at Williams Bay, Wisconsin with probably as many more plants which will bloom next season, the entire thousand originating from two roots given them by Mrs. Hutchinson several years ago. They likewise reported that the seed did not germinate with them.

The Manuals do not tell of it but when *Phymosia* gets any sort of a chance at all it sends out great thick underground rootstocks in all directions, which at frequent intervals bring to the surface a new plant, strong and lusty. Every fall it becomes my painful duty to dig out these invaders from all sorts of unexpected places in the garden where they have intruded. Although there is a four foot gravel walk enclosing a fine colony at Wychwood, Mr. Longland tells me it

frequently appears on the other side of the walk, so vigorous and penetrating are those great rootstocks.

There are probably 150 to 200 plants in the Wychwood Sanctuary growing under various habitat conditions. A small colony is established on a sandy, gravelly island on the lake border, but here the soil is not so congenial and competition from other plants is severe, so that it has not developed the rootstock habit as it has in the garden. Evidently similar conditions obtained at the original Illinois station and occur also in Virginia as described in the July RHODORA, which militated against its spread in this manner.

The authors of the July article note that it bears few lateral branches. The island colony at Wychwood does just this thing, but under cultivation in the garden, frequent lateral branches become the rule rather than the exception.

Another habit which the books do not mention is that its flowers open only in full sun. On cloudy days the flowers never open fully; on sunny days not until about 8:00 or 8:30 a. m., closing about 5:30 to 6:00 in the evening.

It is a strange fate indeed which left one little colony of this plant on a tiny gravelly island in the Kankakee River, Illinois, and another survival 2000 feet up the slope of a Virginia mountain, the two stations so remote that its specific name becomes more meaningful than ever.

DELAVER, WISCONSIN.

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## NOTES ON *FESTUCA OCTOFLORA*

M. L. FERNALD

*FESTUCA OCTOFLORA* Walt., var. **tenella** (Willd.), comb. nov. *F. tenella* Willd. Sp. Pl. i. 419 (1797).

*F. OCTOFLORA*, var. **glauca** (Nutt.), comb. nov. *F. tenella*,  $\beta$  *glauca* Nutt. Trans. Am. Phil. Soc. v. 147 (1834).

*Festuca octoflora* was considered by Piper<sup>1</sup> as a species occurring through the length and breadth of the United States and overlapping into Canada and Mexico. Such an inclusive range is certainly very unusual, if not unprecedented, in our indigenous flora; but, although admitting the species to be "very variable," Piper felt that "for the

<sup>1</sup> Piper, North American Species of *Festuca*, Contrib. U. S. Nat. Herb. x. 11 (1906).



most part the characters are too inconstant for nomenclatorial recognition." Nevertheless, the material in the Gray Herbarium falls rather definitely into four pronounced variations, which, although not absolutely exclusive, have marked geographic segregation. *F. octoflora* came presumably from the Santee valley in South Carolina. Walter, Fl. Carol. 81 (1788), cited no station and "according to Professor A. S. Hitchcock, there is no specimen to represent this species in the part of Walter's herbarium preserved in the British Museum."<sup>1</sup> Walter's preface was written at Santee: "CAROLINAE MERIDIALIS, ad Ripas Fluvii Santee"; consequently, I am taking as typical *F. octoflora* the extreme of the species which abounds in the Santee region.

This plant, typical *F. octoflora*, is the large southern extreme, at once distinguished from the common plant of New England, New York and Pennsylvania by its greater size in all parts; the lower glumes 3.5–4.5 mm. long; the longer awns of the lemmas 3.5–7 mm. long. This plant occurs rather generally in the Southern States from Florida to Texas, thence northward to Oklahoma and southern Illinois and near the coast to southern New Jersey. Typical *F. octoflora* is apparently the plant described as var. *aristulata* L. H. Dewey, Contrib. U. S. Nat. Herb. ii. 457 (1894).

The common plant of the North, from southern Maine to southwestern Quebec, thence to southern British Columbia, south to the interior of Georgia, and to Colorado, with a slight occurrence southward into Arkansas, Texas and California, is smaller in all parts, with loosely spiciform inflorescences; lower glumes 2.3–4 mm. long; lemmas with awns 1–3 mm. long. Rare transitional specimens occur, but in the main the northern series is clearly defined. Willdenow's description of *Festuca tenella* with "*Panicula simplicissima secunda*" and the probability that the plant might originally have been sent from Pennsylvania by Muhlenberg both suggest the northern plant. In order to verify this assumption, I wrote Professor Diels at Berlin and through his unfailing interest and generosity and the great courtesy of Dr. Pilger, who looked up the Willdenow sheet, my identification is now confirmed. The original sheet of Willdenow contained 5 specimens, one of which has now been deposited in the Gray Herbarium. This is a thoroughly characteristic specimen of the northern plant which I am calling *F. octoflora*, var. *tenella*.

<sup>1</sup> Piper, l. c.

In the flatter interior of the United States, centering on Arkansas and Oklahoma, but extending locally eastward to western Florida, northeastward to Illinois, northward to South Dakota and Wyoming and southwestward to New Mexico, much of the material passing as *Festuca octoflora* has a crowded inflorescence, the spikelets imbricated, and the awns of the lemmas greatly reduced or quite wanting, varying from mere mucronate tips to a length of 2 mm., while the glumes are even shorter than in the other varieties, the lower 1.5–3 mm. long. This extreme proves to be *F. tenella*  $\beta$  *glauca* Nutt., very inadequately described from Fort Smith, Arkansas. The type, at the Academy of Natural Sciences of Philadelphia, has been most kindly lent me by Dr. Pennell.

The long-awned western extreme (Colorado and New Mexico to southern California and Lower California) was described as *Festuca pusilla* Buckl. Proc. Acad. Phil. 1862, 98 (1863) from "Upper California, Nuttall" (erroneously transcribed by Piper as "northern California"). A portion of the Nuttall material in the Gray Herbarium shows it to be the common tufted plant of southern California. It is *F. octoflora*, subsp. *hirtella* Piper, l. c. 12 (1906), although the latter subspecies (or variety) was based only on characters of pubescence which seem very inconstant, rather than on the characteristic habit, compact inflorescence and long awns.

GRAY HERBARIUM. \*

*PICEA RUBENS* Sarg., forma ***virgata*** (Rehder), comb. nov. *P. nigra*, var. *virgata* Rehder in Bailey, Cyclop. Am. Hort. iii. 1334 (1901). *P. rubra*, f. *virgata* Rehder, RHODORA, ix. 110 (1907).

By the "homonym" rule adopted at Cambridge the name *Picea rubra* (DuRoi) Link (1831) cannot be maintained, because of the earlier, though "illegitimate," *P. rubra* Dietr. (1824), a direct renaming of *Pinus Abies* L. The first unequivocal name of the American Red Spruce seems to be *P. rubens* Sarg.—M. L. FERNALD AND C. A. WEATHERBY.

PHRAGMITES COMMUNIS Trin., var. ***Berlandieri*** (Fournier), comb. nov. *P. Berlandieri* Fournier, Bull. Bot. Soc. France, xxiv. 178 (1877).

It has long seemed highly improbable that an indigenous plant found throughout temperate and tropical North America should be

quite identical with typical *Phragmites communis* of Europe; and when, at the Fifth International Botanical Congress at Cambridge, a party spent one day on the fenlands whence *Phragmites* is regularly harvested for thatch, the American members very generally felt that there was a difference, though at that time hardly definable, between the English plant and the coarser Reed we knew at home. Study of the European and the North American material brings out no essential morphological differences between the two, but in the American series the spikelets run rather longer than in the European, mostly 1-1.7 cm. long, the European generally described as having spikelets under 1 cm. in length, though sometimes longer. As shown by mature panicles of 28 numbers of the European plant before me the typical *P. communis* has the 1st glume 2.5-5 (av. 3.5) mm. long, the 2nd glume 5-7 (av. 5.7) mm. long. Holmberg describes the European with 1st glume 3, the 2nd 6 mm. long; Ascherson & Graebner say about 2 and 6 mm. respectively; and Hegi says for the 1st somewhat more than 2, the 2nd twice as long. A very large representation of the North American plant (var. *Berlandieri*) gives measurements of the 1st glume 4-6 (av. 4.65) mm. long, of the 2nd 6-8.5 (av. 7.3) mm. long.—M. L. FERNALD, Gray Herbarium.

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